

THE DIAMONDS OF SOUTH AFRICA.

Die diamantführenden Gesteine Südafrikas, ihr Abbau und ihre Aufbereitung. By Dr. Ing. Percy A. Wagner. Pp. xviii+207. (Berlin: Gebrüder Borntraeger, 1909.) Price 7 marks.

AMONG the numerous works that have appeared on the subject of South African diamonds, the book before us is worthy of a very high place. The author has examined the diamond-bearing rocks and their relations during a visit to South Africa, and has studied the materials brought home in the laboratories of Prof. Rosenbusch in Heidelberg, and under Prof. R. Beck at Freiberg, to the latter of whom the work is dedicated.

The record of previous literature at the beginning is very full and complete, comprising the titles of 138 memoirs and books, besides general references to periodical publications. The distribution and character of the various "pipes" are clearly described, and the series of comparative ground-plans drawn to scale on p. 7 is very striking and instructive. The second division of the book contains an admirable account of the various minerals found in the pipes, of which minerals no fewer than about thirty species are described. In his chapter on the petrography of the country, the author adopts the views of Carvill Lewis and Bonney concerning the important part played by the rock to which the first-named author gave the name of "Kimberlite"; but besides the form of the rock first described from the Kimberley district, Dr. Wagner indicates the existence of a variety much richer in mica (biotite), which occurs in dykes in Orangia and northern Cape Colony. These rocks have been carefully studied by the author, who gives chemical analyses of them and the results of investigations under the microscope, illustrated by two plates containing photographs of rock-sections.

Since the discovery of diamonds enclosed in masses of eclogite (the "griquaite" of Beck) in the pipes of South Africa—a discovery announced in this country by Sir William Crookes and Prof. Bonney in 1907—special interest attaches to the various fragmentary rock-masses which occur so frequently in the "blue and yellow grounds" of the South African mines. The author devotes especial attention to the characters of this diamond-bearing eclogite, and cites the case of a similar rock having been found in the Bingera diamond field of New South Wales, as related by Mr. G. W. Card. It is interesting to notice that not only diamond but crystalline plates of graphite have been found by Harger and by Beck, enclosed in the eclogite masses. Various other rock fragments and mineral aggregates occurring with the eclogite masses are described in detail. The evidence of the existence of diamond enclosed in olivine, and of microscopic diamonds distributed through kimberlite, is also discussed, and the bearing of all these and other facts on the vexed question of the origin of the diamond is considered. The whole of the observations bearing on the subject appear to us to be stated very clearly and impartially.

We naturally look in this work for some account of
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the new diamond-fields of German South-west Africa, but at present the information upon the subject appears to be somewhat meagre. According to the only scientific account of the district which has as yet appeared, the diamonds occur in an undisturbed formation of Cretaceous Sandstone. This sandstone, according to Merensky, however, consists in great parts of grains of chalcedony and agate, derived from an amygdaloidal diabase, and it is this rock which is regarded by him as the original source of the diamonds. In 1908 this diamond-field had yielded a great number of small diamonds (usually four or five to the carat) of the aggregate weight of 39,762 carats and of a value of 550,000*l.*

The later chapters of the book deal with the methods of mining the "blue ground," and the different kinds of treatment to which it is subjected in order to extract the diamonds. A number of photographs of the various workings, and of the machinery employed, adds to the interest of these chapters, the information in which has been apparently obtained from trustworthy sources. The work closes with some interesting statistics showing the weight and value of diamonds yielded by each of the mining districts, and the average value per carat in each case. From 1898 to 1908 nearly thirty-one millions of carats were obtained in South Africa.

A LOST OPPORTUNITY.

The Stone Ages in North Britain and Ireland. By the Rev. Frederick Smith. With an introduction by Prof. Augustus H. Keane. Pp. xxiv+377; illustrated. (London: Blackie and Son, Ltd.) Price 6*s.* net.

THE problem of the Stone ages is one that is full of complications. The greater part of it yet remains unsolved, for the sum of our actual knowledge of the conditions of Palæolithic man is as nothing in comparison with our ignorance. By small degrees advances are made. It is found, for example, that in other continents the remains of analogous culture stages bear that striking resemblance to those of our own that is one of the most surprising features of the study of prehistoric man in all periods. But such additions to knowledge, interesting as they are, help but little to enable us to picture the lives of the men whom they concern. The advance must of necessity be slow, for it is given to few to be able to read in nature's writing the very incomplete record of early man. While empiricism may make a lucky shot now and then, it can be only to the trained and reflective searcher that we must look for any effectual progress. Of such trained and industrious men there is no lack, and their accumulated experience, sifted by a master, might even now be brought into line for the less instructed public. Meanwhile, we have enthusiasts, like the Rev. Frederick Smith, who spend years in gathering specimens and deducing theories from them, and present us with ample volumes, like the present one, well printed and fully illustrated, and with this for the moment we must be content.

Mr. Smith is an amateur in all senses of the word.

His love for every stone he has found appears throughout the whole book, and his grief at the loss of one specimen, of which he has only kept a drawing, is almost pathetic. That he is an amateur in the other sense is clearly shown by his method of presenting his case. A careful statement of the evidence which leads him to attribute this or that specimen to the Palæolithic or any age is hardly to be found, while his attitude is one of pure dogmatism with regard to the artificial character of the stones he is principally dealing with. It is manifestly unsafe to judge of such a point as the latter from a drawing alone, and that is all the reviewer has in the present case. But it is not unjust to assume that in Mr. Smith's own drawings of the stones he is dealing with, all the features that lead him to think them to be "artefacts" are shown at their best. Yet to the unprejudiced eye, familiar with man's handiwork in stone under primitive conditions, whether prehistoric or modern, there are very few in Mr. Smith's book that could safely be pronounced "artefacts."

This may appear to be a hard saying, and in a limited degree it is so, for, in default of some evidence, it is hard to think that the majority of the stones represented in Mr. Smith's figures show any signs of human handiwork. Nevertheless, it is quite conceivable that they may be the best that Scottish Palæolithic man could produce. But what is wanted is something approaching proof of human intention in the fashioning of them. Mr. Smith, in short, has mistaken a much-loved hypothesis for fact. As hypothesis, no one would have found fault with his volume. He has spent much time and many words, moreover, in demolishing phantoms; for instance, he is apologetic that his "implements" of basalt and similar rocks do not show the familiar "bulb of percussion," so common in flint tools, and yet he surely must know that the fracture of flint differs essentially from that of basalt or granite; he adduces (p. 14), as proof of the Palæolithic age of the stones, the fact that he never encountered a polished weapon, as if all tools or weapons of the later ages were polished; most assuredly the majority are chipped only. He refers to glacial striæ in support of the same contention, and for this we would commend to him the vast series of Neolithic scrapers with glacial markings that have been collected by Dr. Allen Sturge. Two pages of text and three figures are devoted to a single chipped flint, described (and doubtless rightly) as accidental by "a Cambridge expert." Here a claim is made that the facets of the surface are made to fit the ball of the thumb. As if the human hand had no power of adaptability! It is very likely that this and other flaked flints, whether the flaking be natural or artificial, will be found to fit the ball of the thumb, but the virtue lies in the thumb, not in the flint.

One other instance of Mr. Smith's arguments is worth quoting. He was distressed that the flaking on one of his flints had been set down as due to "thermal" causes. This criticism he meets by the statement that he had watched some of his flints pass through all the rigours of Scottish winters for no less a period than twenty long years, and that they showed

no signs of thermal flaking at the end of it. Arguments of this kind can only convince the converted, and even the support of Prof. Keane, enthusiastic as he is, will hardly suffice to carry conviction to the unbiassed. The chapter on Ireland is of a piece with the rest. The author's naïve surprise at finding in Ireland precisely the same forms he had been finding in Scotland recalls to one's memory the letter from Egypt of the late Mr. Auberon Herbert, who found there the very same broken edges to flint flakes that he had seen in England, though it must be confessed that Mr. Smith does not go to quite the same lengths as Mr. Herbert.

A book of this kind makes one sad. Working on a stable foundation, Mr. Smith's pertinacity and enthusiasm might have enabled him to add his mite to the sum of our knowledge of early man. He has chosen, on the other hand, to follow a will o' the wisp.

CHEMICAL TECHNOLOGY.

- (1) *L'Industria delle Materie Grasse*. Vol. i. I Grassi e le Cere. By Dr. S. Facchini. Pp. xxiii+651. (Milan: Ulrico Hoepli, 1909.) Price 6.50 lire.
- (2) *Gomme, Resine, Gomme-resine e Balsami*. By Dr. Luigi Settimj. Pp. xvi+373. (Milan: Ulrico Hoepli, 1909.) Price 4.50 lire.
- (3) *Analisi Chimiche per gli Ingegneri*. By Dr. Luigi Medri. Pp. xiv+313. (Milan: Ulrico Hoepli, 1909.) Price 3.50 lire.
- (4) *Die Chemische Industrie*. By Gustav Müller unter mitwirkung von Dr. Fritz Bennigson. Pp. viii+488. (Leipzig: B. G. Teubner, 1909.) Price 11.20 marks.
- (5) *Chemical Industry on the Continent: a Report to the Electors of the Gartside Scholarship*. By Harold Baron. Pp. xi+71. (Manchester: University Press, 1909.) Price 1s. net.
- (6) *Laboratory Guide of Industrial Chemistry*. By Dr. Allen Rogers. Pp. ix+158. (London: Constable and Co., Ltd., 1908.) Price 6s. net.

THESE three volumes belong to the well-known and excellent "Manuali Hoepli." Dr. Facchini's treatise is the first volume of a series which, when completed, will cover the whole ground of the industry of fats, oils and soaps. It deals with the general chemistry of the fats and waxes, and the methods used in their analysis. It is a concise but fairly complete summary of the information included in the larger treatises on the subject, and should prove a useful book of reference in cases where the larger works are not available. The same remarks apply to the treatise on gums and resins by Dr. Settimj, which necessarily is in the main but a well-arranged and useful abstract of Tschirch's standard handbook.

Dr. Medri's little book on analysis is a compilation designed specially for the use of engineers rather than chemists. It summarises the methods of analysis of air, water, cement materials, combustibles—solid, liquid and gaseous—and of several of the principal metals and alloys in general use. There is also a short chapter on explosives.